

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1-2. (Cancelled)

3. (Currently Amended) A method for providing a real-time broadcast service in a mobile communication system, the mobile communication system comprises a radio access network and a plurality of mobile terminals, where the radio access network has an original service hierarchy, and the original service hierarchy is divided into cells and provides original services using carrier frequencies of the original service hierarchy; the method comprising:

adding a broadcast service hierarchy into the radio access network, assigning a downlink special carrier frequency for the broadcast service hierarchy, and broadcasting the real-time broadcast service to the mobile terminals through the downlink special carrier frequency, wherein the downlink special carrier frequency is different from the carrier frequencies of the original service hierarchy, ~~and is not used for bearing the original services~~; and

dividing the broadcast service hierarchy into cells, all the cells of the broadcast service hierarchy employing the same downlink special carrier frequency, ~~the adjacent cells employing different scrambling codes~~, defining multiple cells into a location area,

and transmitting the same content of the real-time broadcast service in the cells of the broadcast service hierarchy wherein the adjacent cells employ different scrambling codes;

any of the mobile terminals implementing the original services using the carrier frequencies of the original service hierarchy, receiving the real-time broadcast service using the downlink special carrier frequency.

4. (Previously Presented) The method according to claim 3, further comprising: setting a broadcast channel for broadcasting corresponding cell information and a paging channel for paging mobile terminals in the cell of the broadcast service hierarchy.

5. (Previously Presented) The method according to claim 4, wherein said cell information includes location area code and paging channel configuration information of the cell in the broadcast service hierarchy, and carrier frequencies, scrambling codes, Random Access Channel (RACH), an AICH public channel relating to RACH and Forward Access Channel (FACH) of the adjacent cells in the original service hierarchy.

6. (Previously Presented) The method according to claim 3, wherein the scrambling codes in the broadcast service hierarchy and those in the original service

hierarchy are either the same or different; the cells of the broadcast service hierarchy and those of the original service hierarchy are either superposed or not.

7. (Previously Presented) The method according to claim 3, wherein the handoff includes location update which is triggered when the mobile terminal switches between the broadcast service hierarchy and the original service hierarchy, and when the location area of the mobile terminal changes in the broadcast service hierarchy.

8. (Previously Presented) The method according to claim 7, wherein the process of triggering location update when the location area changes in the broadcast service hierarchy comprising: the mobile terminal obtaining information of cells in the original service hierarchy from the broadcast channel of the broadcast service hierarchy, the cells in the original service hierarchy are adjacent to the current cell of the broadcast service hierarchy, finding a cell in the original service hierarchy where the mobile terminal can stay, and sending a random access request utilizing the Random Access Channel (RACH) in the cell of the original service hierarchy;

after receiving AICH information from the cell of the original service hierarchy, the mobile terminal tuning the receiving frequency to the downlink carrier frequency, starting search and synchronization for the current cell of the broadcast service hierarchy, meanwhile sending a message containing location update information to the radio access network utilizing the uplink carrier frequency of the original service hierarchy,

and waiting to receive a location update confirming message at the current cell of the broadcast service hierarchy.

9. (Previously Presented) The method according to claim 3, wherein the process of monitoring paging in the broadcast service hierarchy comprising: the radio access network selecting a cell in a corresponding location area according to the received location information of the mobile terminal, and sending downlink paging information according to the carrier frequency of the broadcast service hierarchy or the carrier frequency of the original service hierarchy.

10. (Previously Presented) The method according to claim 3, further comprising: after switching from the broadcast service hierarchy to the original service hierarchy, the mobile terminal making a reply or initiating a call in the original service hierarchy.

11. (Previously Presented) The method according to claim 10, wherein the process of making a reply or initiating a call further comprising: sending information of the adjacent cells in the original service hierarchy utilizing the broadcast channel of the broadcast service hierarchy.

12. (Previously Presented) The method according to claim 3, wherein the mobile terminal shares a set of receiving system and synchronizing system with other mobile terminals in the broadcast service hierarchy and the original service hierarchy.

13. (Previously Presented) The method according to claim 3, wherein the mobile terminal utilizes a different receiving system, and shares a set of synchronizing system with other mobile terminals in the broadcast service hierarchy and the original service hierarchy.

14. (Currently Amended) A method for providing a real-time broadcast service in a mobile communication system, the mobile communication system comprises a radio access network and a plurality of mobile terminals, where the radio access network has an original service hierarchy, and the original service hierarchy is divided into cells and provides original services using scrambling codes of the original service hierarchy; the method comprising:

adding a broadcast service hierarchy into the radio access network, dividing the broadcast service hierarchy into cells, assigning downlink special scrambling code for the broadcast service hierarchy, and using the same downlink special scrambling code to broadcast the same content of the real-time broadcast service to the mobile terminals in the cells of the broadcast service hierarchy~~through the downlink special scrambling codes~~, wherein the downlink special scrambling code is different from the scrambling codes of the original service hierarchy, and the signals of the real-time broadcast service transmitted in the cells of the broadcast service hierarchy are the same, and is not used for bearing the original services; and

dividing the broadcast service hierarchy into cells,

superposing locations of the cells of the broadcast service hierarchy over those of the original service hierarchy so as to form the structure of the cells of the original service hierarchy plus the cells of the broadcast service hierarchy, wherein the cells of the broadcast service hierarchy utilize the same downlink special scrambling code for transmitting the real-time broadcast service;

any of the mobile terminals implementing the original services using the scrambling codes of the original service hierarchy, receiving the real-time broadcast service using the downlink special scrambling code.

15. (Previously Presented) The method according to claim 14, wherein the process of assigning a downlink special scrambling code in the broadcast service hierarchy comprising: adding a scrambling operation using the downlink special scrambling code in the base station sender of each cell in the original service hierarchy, wherein the information of the broadcast service hierarchy and that of the original service hierarchy either share the same power amplifier or utilize respective power amplifiers.

16. (Previously Presented) The method according to claim 15, wherein the process of the sender includes performing modulation and spectrum spreading for the original service and real-time broadcast service;

the modulation and spectrum spreading for the original service includes source encoding, channel encoding, Quaternary Phase-Shift Keying (QPSK), spectrum spreading and scrambling the spectrum spread results utilizing the downlink scrambling code of each cell for the original service;

the modulation and spectrum spreading for the real-time broadcast service includes source encoding, channel encoding, QPSK, spectrum spreading and

scrambling the spectrum spread results utilizing the downlink special scrambling code for the real-time broadcast service.

17. (Currently Amended) The method according to claim 14, wherein the demodulation unit of RAKE receiver of the mobile terminal adopts the downlink special scrambling code for specially receiving the real-time broadcast service; after the signals pass the RAKE receiver, the signal of original service and the signal of broadcast service are separated, and channel decoding and source decoding is implemented respectively for of the original service and those of real-time broadcast service are implemented separately after the signals pass the RAKE receiver; the channel code of RAKE receiver is the special broadcast channel code, namely the downlink special scrambling code.

18. (Previously Presented) The method according to claim 14, wherein said structure of the cell of the original service hierarchy plus the cell of the broadcast service hierarchy is that range and location division of the cell of the original service hierarchy plus the broadcast service hierarchy is the same as that of the original service macro cell coving hierarchy in which the mobile network is covered by macro cells.

19. (Previously Presented) The method according to claim 14, wherein the method further comprising: keeping the mobile terminal under idle mode for the original service when the mobile terminal switches to the broadcast service hierarchy; when the

mobile terminal is located in a macro cell, according to the channel estimation result for the public pilot frequency of this cell and the channel estimation result for the public pilot frequency of one or multiple adjacent cells with powerful signals, merging the received signals of multi cells and demodulating the signals on special broadcast channel; the mobile terminal selecting and reselecting cells, implementing location update and receiving paging information in terms of the process of original service; when the mobile terminal is located in a micro cell or a pico cell, according to the channel estimation result for the public pilot frequency of one or multiple adjacent cells with powerful signals, merging the received signals of multi cells and demodulating the signals on special broadcast channel; the mobile terminal selecting and reselecting cells, implementing location update and receiving paging information in terms of the process of original service.

20. (Previously Presented) The method according to claim 14, further comprising: the mobile terminal evaluating the interference value to a service channel caused by the downlink special scrambling code according to the demodulated special broadcast channel data and the information of channel transmission condition, scrambling code and channel code, and subtracting this interference value from the received signal.

21. (Cancelled)

22. (Previously Presented) The method according to claim 3, further comprising: the mobile terminal switching between the original service hierarchy and the broadcast service hierarchy, and

when switching to the broadcast service hierarchy, the mobile terminal staying in a cell of the broadcast service hierarchy, controlling handoff of the cell, and monitoring paging of the cell in the broadcast service hierarchy.

23. (Previously Presented) The method according to claim 15, further comprising: the mobile terminal switching between the original service hierarchy and the broadcast service hierarchy, wherein

the working mode of the mobile terminal keeps unchanged for the original service, pilot channel of the cells in the original service hierarchy is shared, and the real-time broadcast service is supported under both idling mode and connecting mode.

24. (New) The method according to claim 14, wherein a same broadcast channel code is employed in all the cells of the broadcast service hierarchy for transmitting the broadcast service.